

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A preform for a photonic band-gap optical fibre waveguide, comprising a stack of parallel, elongate primary elements and elongate secondary elements in which, in the transverse cross section, the primary elements have a largest external dimension and groups of primary elements define first interstitial regions, in at least some of which there is or are respectively one or more secondary elements having a largest external dimension which is less than one third of the size of each of the largest external dimensions of the surrounding primary elements, and

wherein the arrangement of primary and secondary elongate elements is enclosed, in the transverse cross section, by a large diameter capillary, thereby forming a plurality of outer interstitial regions between an inner periphery of the large diameter capillary and the arrangement of primary and secondary elements.

2. (Currently Amended) A preform according to claim 1, wherein at least some of the first interstitial regions are defined by groups of fewer than six primary elements.

3. (Currently Amended) A preform according to claim 1, wherein at least some of the first interstitial regions are defined by three primary elements.

4. (Currently Amended) A preform according to claim 1, wherein substantially all of the first interstitial regions are defined by three primary elements.
5. (Currently Amended) A preform according to claim 1, wherein at least some of the first interstitial regions are enclosed by abutting primary elements.
6. (Currently Amended) A preform according to claim 1, wherein substantially all of the first interstitial regions are enclosed by abutting primary elements.
7. (Currently Amended) A preform according to claim 1, wherein each primary element that defines one of the first interstitial region regions abuts at least one of the one or more secondary elements that is (or are) in that region.
8. (Currently Amended) A preform according to claim 1 for a photonic band-gap optical fibre waveguide, comprising a stack of parallel, elongate primary elements and elongate secondary elements in which, in the transverse cross section, the primary elements have a largest external dimension and groups of primary elements define interstitial regions, in at least some of which there is or are respectively one or more secondary elements having a largest external dimension which is less than one third of the size of each of the largest external dimensions of the surrounding primary elements, wherein the primary elements are non-tessellating.

9. (Currently Amended) A preform according to claim 1, wherein at least some of the first interstitial regions contain plural secondary elements.

10. (Previously Presented) A preform according to claim 1, wherein at least some of the secondary elements are capillaries.

11. (Previously Presented) A preform according to claim 1, wherein at least some of the secondary elements are rods.

12. (Previously Presented) A preform according to claim 1, wherein at least some of the primary elements are capillaries.

13. (Previously Presented) A preform according to claim 1, wherein at least some of the primary elements have a circular cross section.

14. (Previously Presented) A preform according to claim 1, wherein substantially all of the primary elements have the same cross sectional shape.

15. (Currently Amended) A preform according to claim 1, wherein each of the first interstitial region regions containing one or more secondary elements contains substantially the same arrangement of one or more secondary elements.

16. (Previously Presented) A preform according to claim 1, wherein substantially all interstitial voids contain one or more secondary elements.

17. (Previously Presented) A preform according to claim 1, wherein the primary elements each have a similar largest external dimension.

18. (Previously Presented) A preform according to claim 1, wherein at least a portion of the preform comprises a periodic arrangement of primary and secondary elements having a first characteristic pitch.

19. (Original) A preform according to claim 18, wherein the arrangement of primary elements has a second characteristic pitch.

20. (Original) A preform according to claim 19, wherein the arrangement of interstitial regions, containing secondary elements, has a third characteristic pitch.

21. (Original) A preform according to claim 20, wherein the second and third characteristic pitches are the same.

22. (Currently Amended) A preform according to claim 20, for a photonic band-gap optical fibre waveguide, comprising a stack of parallel, elongate primary elements and elongate secondary elements in which, in the transverse cross section, the primary elements have a largest external dimension and groups of primary elements define interstitial regions, in at least some of which there is or are

respectively one or more secondary elements having a largest external dimension which is less than one third of the size of each of the largest external dimensions of the surrounding primary elements,

wherein at least a portion of the preform comprises a periodic arrangement of the primary and secondary elements having a first characteristic pitch, the arrangement of the primary elements has a second characteristic pitch; the arrangement of interstitial regions, containing the secondary elements, has a third characteristic pitch, and the third characteristic pitch is larger than the second characteristic pitch.

23. (Previously Presented) A preform according to claim 1, wherein the primary elements form a substantially triangular array.

24. (Previously Presented) A preform according to claim 1, wherein the primary elements form a substantially hexagonal array.

25. (Currently Amended) A preform ~~according to claim 1, for a photonic band-gap optical fibre waveguide, comprising a stack of parallel, elongate primary elements and elongate secondary elements in which, in the transverse cross section, the primary elements have a largest external dimension and groups of primary elements define interstitial regions, in at least some of which there is or are respectively one or more secondary elements having a largest external dimension which is less than one third of the size of each of the largest external dimensions of the surrounding primary elements, wherein, in the transverse cross section, the~~

primary and secondary elongate elements are arranged around a further parallel elongate element, thereby forming a plurality of second interstitial regions between an outer periphery of the further elongate element and the arrangement of first and second elongate elements.

26. (Original) A preform according to claim 25, wherein the second interstitial regions remain empty.

27. (Original) A preform according to claim 25, wherein at least some of the second interstitial regions contain one or more secondary elements.

28. (Cancelled)

29. (Currently Amended) A preform according to claim [[28]] 1, wherein at least some of the third outer interstitial regions contain one or more secondary elements.

30. (Previously Presented) An optical fibre made from a preform as claimed in claim 1.

31. (Original) An optical fibre according to claim 30, which is a photonic band-gap optical fibre.

32. (Previously Presented) An optical fibre according to claim 31, which has a minimum loss less than 12dB/km.

33. (Previously Presented) A method of forming a photonic band-gap fibre, comprising the steps of forming a preform according to claim 1, and heating and drawing the preform, in one or more stages, into the fibre.

34. (Original) A method according to claim 33, comprising the step of arranging primary elements to form interstitial regions and then inserting, in a longitudinal motion, the secondary elements into the interstitial regions.

35. (Original) A method according to claim 33, comprising the step of laying discrete layers of primary and secondary elements on to one another to form a stack of primary and secondary elements.

36. (Original) A method according to claim 35, comprising using automated equipment to position primary and secondary elements.

37. (New) A preform according to claim 1, wherein, in the transverse cross section, the primary and secondary elongate elements are arranged around a further parallel elongate element, thereby forming a plurality of inner interstitial regions between an outer periphery of the further elongate element and the arrangement of first and second elongate elements.